Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A system for measuring a voltage in a body part, the system comprising

a multiplexing unit;

N body leads for electrically connecting the multiplexing unit to the body part; [[and]]

an impedance module for generating a current and for measuring a resultant voltage, the impedance module calculating an impedance from the current and the resultant voltage;

a controller switching unit electrically connecting the impedance module to the multiplexing unit, the controller switching unit having a first switch connected to the multiplexer and at least a second switch connected to the multiplexer [[for]] to allow[[ing]] [[a]] the current to flow through the body part between two body leads, n_1 and n_2 of the N body leads, and [[a]] the resultant voltage to be measured between two body leads, n_3 and n_4 of the N body leads, where $n_1 \neq n_2$ and $n_3 \neq n_4$, but where n_1 n_2 n_3 and n_4 need not otherwise be distinct[[.]];

a current input lead connected to the first switch for injecting the current into the body part;

a current output lead connected to the second switch for receiving the current from the body part; and

a first voltage lead connected to the first switch and a second voltage lead connected to the second switch for measuring the resultant voltage.

Claim 2 (original): The system of claim 1, wherein the multiplexing unit includes

a multiplexer; and

a first MX lead, a second MX lead, a third MX lead and a fourth MX lead for connecting the controller switching unit to the multiplexer.

Claim 3 (currently amended): The system of claim 2, wherein ~~the controller switching unit includes~~

[[a]] the first switch is connected to the multiplexer by the first MX lead and the second MX lead; and

[[a]] the second switch is connected to the multiplexer by the third MX lead and the fourth MX lead[[;]].

~~a current input lead connected to the first switch for injecting the current into the body part;~~

~~a current output lead connected to the second switch for receiving the current from the body part; and~~

~~a first voltage lead connected to the first switch and a second voltage lead connected to the second switch for measuring the resultant voltage.~~

Claim 4 (original): The system of claim 3, wherein the controller switching unit can be in a bipolar mode, corresponding to $n_1 = n_3$ or n_4, and $n_2 = n_3$ or n_4, or a tetrapolar mode, corresponding to n_1, n_2, n_3 and n_4 being all distinct.

Claim 5 (original): The system of claim 4, wherein, in the bipolar mode, the current input lead and the first voltage lead are electrically connected to each other and to exactly one of the first MX lead and the second MX lead, and the current output lead and the second voltage lead are electrically connected to each other and to exactly one of the third MX lead and the fourth MX lead.

Claim 6 (original): The system of claim 4, wherein, in the tetrapolar mode, the current input lead is electrically connected to exactly one of the first MX lead and the second MX lead and the first voltage lead is electrically connected to the other one of the first

MX lead and the second MX lead, and the current output lead is electrically connected to exactly one of the third MX lead and the fourth MX lead and the second voltage lead is electrically connected to the other one of the third MX lead and the fourth MX lead.

Claim 7 (original): The system of claim 3, further comprising an internal load electrically connected to the first MX lead, the second MX lead, the third MX lead and the fourth MX lead, the internal load used for at least one of internal testing of the system and varying measurement range of the system.

Claim 8 (original): The system of claim 1, wherein the controller switching unit includes a controller for controlling switch states in the first switch and the second switch, and for controlling multiplexing states in the multiplexer.

Claim 9 (original): The system of claim 1, wherein the body part is a breast.

Claim 10 (canceled)

Claim 11 (currently amended): The system of claim [[10]] 11, further comprising a diagnosis module for diagnosing the possibility of disease in the body part based on the impedance.

Claim 12 (currently amended): A method for measuring a voltage in a body part, the method comprising

providing a multiplexing unit;

connecting the body part to the multiplexing unit with N body leads;

generating a current with an impedance module;

electrically connecting the multiplexer to a first switch in a controller switching unit;

electrically connecting the multiplexer to a second switch in the controller switching unit;

injecting current into the body part with a current input lead that is connected to the first switch so that current is sent by the multiplexer between two body leads, n_1 and n_2 of the N body leads in response to control signals sent by the controller switching unit;

receiving the current from the body part with a current output lead that is connected to the second switch;

measuring a resultant voltage between two body leads, n_3 and n_4 of the N body leads, where $n_1 \neq n_2$ and $n_3 \neq n_4$, but where n_1, n_2, n_3 and n_4 need not otherwise be distinct, the resultant voltage measured with a first voltage lead connected to the first switch and a second voltage lead connected to the second switch;

measuring the resultant voltage with the impedance module; and

calculating an impedance from the current and the resultant voltage.

~~sending a current through the body part between two body leads, n_1 and n_2 of the N body leads in response to control signals sent by a controller switching unit; and~~

~~measuring a resultant voltage between two body leads, n_3 and n_4 of the N body leads, where $n_1 \neq n_2$ and $n_3 \neq n_4$, but where n_1, n_2, n_3 and n_4 need not otherwise be distinct.~~

Claim 13 (currently amended): The method of claim 12, ~~wherein the step of providing includes providing a multiplexer,~~ the method further comprising

electrically connecting the controller switching unit to the multiplexer with a first MX lead, a second MX lead, a third MX lead and a fourth MX lead.

Claim 14 (currently amended): The method of claim 13, further comprising

electrically connecting the multiplexer to [[a]] the first switch in the controller switching unit with the first MX lead and the second MX lead; and

electrically connecting the multiplexer to [[a]] the second switch in the controller switching unit with the third MX lead and the fourth MX lead[[;]].

~~injecting the current into the body part with a current input lead that is connected to the first switch;~~

~~receiving the current from the body part with a current output lead that is connected to the second switch; and~~

~~measuring the resultant voltage with a first voltage lead connected to the first switch and a second voltage lead connected to the second switch.~~

Claim 15 (original): The method of claim 14, further comprising placing the controller switching unit in a bipolar mode, corresponding to $n_1 = n_3$ or n_4, and $n_2 = n_3$ or n_4, or a tetrapolar mode, corresponding to n_1, n_2, n_3 and n_4 all being distinct.

Claim 16 (original): The method of claim 15, wherein the step of placing the controller switching unit in a bipolar mode includes

electrically connecting the current input lead and the first voltage lead to each other and to exactly one of the first MX lead and the second MX lead; and

electrically connecting the current output lead and the second voltage lead to each other and to exactly one of the third MX lead and the fourth MX lead.

Claim 17 (original): The method of claim 16, wherein the step of placing the controller switching unit in a tetrapolar mode includes

electrically connecting the current input lead to exactly one of the first MX lead and the second MX lead;

electrically connecting the first voltage lead to the other one of the first MX lead and the second MX lead;

electrically connecting the current output lead to exactly one of the third MX lead and the fourth MX lead; and

electrically connecting the second voltage lead to the other one of the third MX lead and the fourth MX lead.

Claim 18 (original): The method of claim 14, further comprising providing an internal load electrically connected to the first MX lead, the second MX lead, the third MX lead and the fourth MX lead; and

using the internal load used for at least one of internal testing of the system and varying measurement range of the system.

Claim 19 (original): The method of claim 12, wherein the body part is a breast.

Claim 20 (canceled)

Claim 21 (currently amended): The method of claim [[20]] 12 further comprising diagnosing the possibility of disease in the body part based on the impedance.

Claims 22–26 (canceled)